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UTILITY PATENT APPLICATION TRANSMITTAL
(Large Entity)*(Only for new nonprovisional applications under 37 CFR 1.53(b))*Docket No.
13768.142Total Pages in this Submission
4**TO THE ASSISTANT COMMISSIONER FOR PATENTS**Box Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

USING AN EXPERT PROXY SERVER AS AN AGENT FOR WIRELESS DEVICES

and invented by:

Donald J. Kadyk, Neil S. Fishman, & Marc SeinfeldIf a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 30 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications *(if applicable)*
 - c. ☐ Statement Regarding Federally-sponsored Research/Development *(if applicable)*
 - d. ☐ Reference to Microfiche Appendix *(if applicable)*
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings *(if drawings filed)*
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) (when necessary as prescribed by 35 USC 113)
- a. ☒ Formal Number of Sheets 3
- b. ☐ Informal Number of Sheets _____
4. ☒ Oath or Declaration
- a. ☒ Newly executed (original or copy) ☐ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) (for continuation/divisional application only)
- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (usable if Box 4b is checked)
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche (Appendix)
7. ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, all must be included)
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy (identical to computer copy)
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☒ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(B) Statement (when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class ☒ Express Mail (Specify Label No.): EL 550 340 310 US

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Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

16. ☒ Additional Enclosures *(please identify below):*

Form PTO-2038

Attachment (for correspondence)

Request That Application Not Be Published Pursuant To 35 U.S.C. 122(b)(2)

17. ☐ Pursuant to 35 U.S.C. 122(b)(2), Applicant hereby requests that this patent application not be published pursuant to 35 U.S.C. 122(b)(1). Applicant hereby certifies that the invention disclosed in this application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication of applications 18 months after filing of the application.

Warning

An applicant who makes a request not to publish, but who subsequently files in a foreign country or under a multilateral international agreement specified in 35 U.S.C. 122(b)(2)(B)(i), must notify the Director of such filing not later than 45 days after the date of the filing of such foreign or international application. A failure of the applicant to provide such notice within the prescribed period shall result in the application being regarded as abandoned, unless it is shown to the satisfaction of the Director that the delay in submitting the notice was unintentional.

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Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra	Rate	Fee
Total Claims	24	- 20 =	4	x \$18.00	\$72.00
Indep. Claims	4	- 3 =	1	x \$80.00	\$80.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
BASIC FEE					\$710.00
OTHER FEE (specify purpose) Assignment Recordation Fee					\$40.00
TOTAL FILING FEE					\$902.00

- ☒ A check in the amount of \$902.00 to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. 23-3178 as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
- ☒ Credit any overpayment.
- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b)



Signature

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Registration No. 42,785



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Dated: October 6, 2000

CC:

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CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)

Applicant(s): Donald J. Kadyk, Neil S. Fishman, and Marc Seinfeld

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13768.142

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October 6, 2000Examiner
Not Yet AssignedGroup Art Unit
Not Yet Assigned

Invention: USING AN EXPERT PROXY SERVER AS AN AGENT FOR WIRELESS DEVICES

I hereby certify that this correspondence listed as transmitted below

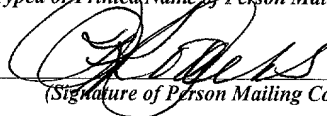
(Identify type of correspondence)

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under
37 CFR 1.10 in an envelope addressed to: The Assistant Commissioner for Patents, Washington, D.C. 20231 on
October 6, 2000

(Date)

Lisa L. Rogers

(Typed or Printed Name of Person Mailing Correspondence)



(Signature of Person Mailing Correspondence)

EL 550 340 310 US

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TRANSMITTED:

- ▶ Patent Application 30 pgs.
- ▶ Formal Drawings 3 sheets
- ▶ Transmittal Letter in Triplicate 1 pg.
- ▶ Form PTO-2038 (\$902) 1 pg.
- ▶ Correspondence attachment 1 pg.
- ▶ Declaration, Power of Attorney & Petition 3 pgs.
- ▶ Assignment w/Cover Sheet 5 pgs.
- ▶ Certificate of Express Mailing 1 pg.
- ▶ Postcard

UNITED STATES PATENT APPLICATION

of

Donald J. Kadyk,

Neil S. Fishman, and

Marc Seinfeld

for

USING AN EXPERT PROXY SERVER AS AN AGENT FOR WIRELESS DEVICES

BACKGROUND OF THE INVENTION

1. The Field of the Invention

The present invention relates to computer networks. More particularly, the present invention relates to methods, systems and data structures for using an advanced proxy server computer system as an agent for a wireless device.

2. The Prior State of the Art

The Internet has transformed the way people communicate and obtain information. With minimal effort, anyone with access to an Internet ready computer system can send e-mail and access information throughout the world. Recently, the Internet has become available to many wireless devices thus increasing Internet accessibility even more.

Wireless devices are highly portable since they do not rely on a wired connection to a network and since they tend to be much smaller and lighter than desk-top personal computers. This portability is highly convenient in that it allows the wireless device to be easily carried, and allows the wireless device to be used wherever the user carries it.

However, the convenience of portability also comes with a cost. Specifically, wireless devices communicate over wireless networks which, in general, are slower than wired networks. Also, the wireless devices often have limited processing and memory capability due to their small size as compared to desk-top personal computers. Therefore, the wireless devices typically cannot perform the type of complex tasks that may be expected of more robust client devices. What is desired is a way of enabling wireless devices to provide more robust services even if the wireless device has limited processing and memory capability, and uses a slower wireless link.

SUMMARY OF THE INVENTION

The present invention does indeed enable wireless devices to provide more robust services even if the wireless device has limited processing, memory, and bandwidth capability. This may be accomplished by providing an expert proxy server computer system that acts as an agent on behalf of a wireless device.

The expert proxy server computer system is coupled to a number of wireless devices through a wireless network. The expert proxy server is also coupled to a number of server computer systems through an external network such as, for example, the Internet. The expert proxy server provides a service for the wireless device by offering a plurality of applications implemented on the proxy server and/or on the server computer systems on the external network.

In accordance with the present invention, the expert proxy server determines that a service is to be provided to a wireless device. This determination may be made in response to a request for the service to be provided made by the wireless device or some other device. Alternatively, the determination could be based on a configuration setting made when the expert proxy server was installed or when the wireless device registered with the expert proxy server.

Next, the expert proxy server identifies an application that provides the service and then communicates with the identified application that provides the service. In order to provide the service, the expert proxy server may need to engage in extensive communications with other network sites. Since this extensive communication is provided by the expert proxy server instead of by the wireless device, the bandwidth of the wireless network is not used up by such communications. Furthermore, the processing at the wireless device is not used to engage in the more extensive communications. Also, the

1 wireless device need not store the more complex application that is used to engage in the
2 more complex communication. Instead, the most that the wireless device did was to make
3 a simple request for the service if such a request was made at all.

4 The expert proxy server compiles the results of the communication with the
5 application and then transmits the compilation to the wireless device over the wireless
6 network. Thus, the relatively smaller bandwidth of the wireless network is preserved by
7 transmitting a minimal amount of information over the wireless network while leaving
8 more extensive communications to occur over higher bandwidth external networks. Also,
9 since the extensive processing occurs at the expert proxy server rather than at the wireless
10 device, the application on the wireless device may be simplified and smaller as compared
11 to the supporting applications on the expert proxy server thereby preserving the limited
12 memory and processing capability of the wireless device.

13 Additional features and advantages of the invention will be set forth in the
14 description which follows, and in part will be obvious from the description, or may be
15 learned by the practice of the invention. The features and advantages of the invention may
16 be realized and obtained by means of the instruments and combinations particularly
17 pointed out in the appended claims. These and other features of the present invention will
18 become more fully apparent from the following description and appended claims, or may
19 be learned by the practice of the invention as set forth hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the manner in which the above-recited and other advantages and features of the invention are obtained, a more particular description of the invention briefly described above will be rendered by reference to specific embodiments thereof which are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the invention and are not therefore to be considered limiting of its scope, the invention will be described and explained with additional specificity and detail through the use of the accompanying drawings in which:

Figure 1 illustrates a network environment in which the present invention may be implemented including an expert proxy server connected to a number of wireless devices through a wireless network and to a number of servers through an external network;

Figure 2 illustrates at least some of the components that the expert proxy server and the other servers may include; and

Figure 3 illustrates a flowchart of a method for the expert proxy server to act as an agent on behalf of a wireless device.

DETAILED DESCRIPTION OF THE INVENTION

The present invention extends to methods, systems and data structures for using an expert proxy server as an agent for wireless devices. The expert proxy server first determines that a service is to be provided to the wireless device. The expert proxy server then identifies an application that provides the requested service and communicates with the identified application. The proxy server then compiles the results of the communication with the identified application and transmits the compilation to the wireless device.

The expert proxy server preserves the limited memory capacity of the wireless device by allowing the application and the associated data to be stored elsewhere at the expert proxy server or at another server computer system. The expert proxy server preserves the limited processing capacity of the wireless device by allowing another device to run the application. The expert proxy server also preserves the bandwidth of the wireless network by allowing the wireless device to communicate with the expert proxy server using a simple protocol. If a more complex protocol is required to communicate with the application, then the expert proxy server communicates with the application using the complex protocol rather than requiring the wireless device to communicate using the more complex protocol. In short, the expert proxy server acts as an agent of the wireless device in ways that reduce the memory, processing, and bandwidth requirements of the wireless device.

Embodiments within the scope of the present invention include computer-readable media for carrying or having computer-executable instructions or data structures stored thereon. Such computer-readable media can be any available media which can be accessed by a general purpose or special purpose computer. By way of example, and not limitation,

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When information is transferred or provided over a network or another communications connection (either hardwired, wireless, or a combination of hardwired or wireless) to a computer, the computer properly views the connection as a computer-readable medium. Thus, any such connection is properly termed a computer-readable medium. Combinations of the above should also be included within the scope of computer-readable media. Computer-executable instructions comprise, for example, instructions and data which cause a general purpose computer, special purpose computer, or special purpose processing device to perform a certain function or group of functions.

Figure 1 illustrates a network 100 that represents a suitable operating environment for the present invention. The network 100 includes a plurality of wireless devices 110 including wireless devices 110a through 110d which communicate over a wireless network 120 with a server computer system (hereinafter, “expert proxy server”) 130. It will be understood that the present invention may be readily applied using other types of “wired” devices as well. The choice of technology for communication with such wireless or wired devices (“devices”) is not critical. The expert proxy server 130 may communicate over an external network 140 such as the Internet with a plurality of server computer systems 150.

Although not required, the invention will be described in the general context of computer-executable instructions, such as applications or program modules, being executed by computers in network environments. Generally, program modules include

1 routines, programs, objects, components, data structures, etc. that perform particular tasks
2 or implement particular abstract data types. Computer-executable instructions, associated
3 data structures, and program modules represent examples of the program code means for
4 executing steps of the methods disclosed herein. The particular sequence of such
5 executable instructions or associated data structures represent examples of corresponding
6 acts for implementing the functions described in such steps.

7 Figure 1 shows some of the internal structure of the wireless device 110a. The
8 wireless device 110a includes a processing device 111 and a memory device 112. The
9 memory device 112 stores generic application or program modules 113, 114, 115, 116, 117
10 and 118. Each of these program modules may be a “generic” version of an application. In
11 this description and in the claims, a “generic” version of an application means a version of
12 an application that performs a service that includes tasks that are generally common to all
13 applications that perform the service, the task not necessarily following the specific
14 implementations of a specific application that provides the service. The meaning of the
15 word “generic” will be made clearer from the following description in which several
16 example generic applications are described.

17 For example, program module 113, when executed by processing device 111,
18 supports instant messaging services. Program module 114 supports storage services.
19 Program module 115 supports customized page services. Program module 116 supports
20 reservations services. Program 117 supports bidding services. Although not shown,
21 wireless devices 110b, 110c and 110d may support similar services. While the application
22 of each of these services to the present invention is described below, those skilled in the art
23 will recognize that the principles of the present invention may be applied to other services
24 as well (see other services module 118).

1 The instant messaging services module 113 supports functionality that is
2 generically common to generally all instant messaging systems. Such functionality might
3 include, for example, storing presence data and creating, transmitting, receiving and
4 presenting instant messages, and the like. The storage services module 114, customized
5 page services module 115, reservations services module 116, bidding services module 117,
6 and other services module 118 also support functionality that is generically common to
7 generally all applications that provide similar services.

8 The expert proxy server 130 and the servers 150 may comprise or be comprised of
9 a special purpose or general-purpose computer including various computer hardware and
10 software. An example of a conventional general-purpose computer that may be used to
11 implement the expert proxy server 130 or the servers 150 is illustrated as computer 220 in
12 Figure 2.

13 The conventional computer 220 includes a processing unit 221, a system memory
14 222, and a system bus 223 that couples various system components including the system
15 memory 222 to the processing unit 221. The system bus 223 may be any of several types
16 of bus structures including a memory bus or memory controller, a peripheral bus, and a
17 local bus using any of a variety of bus architectures. The system memory includes read
18 only memory (ROM) 224 and random access memory (RAM) 225. A basic input/output
19 system (BIOS) 226, containing the basic routines that help transfer information between
20 elements within the computer 220, such as during start-up, may be stored in ROM 224.

21 The computer 220 may also include a magnetic hard disk drive 227 for reading
22 from and writing to a magnetic hard disk 239, a magnetic disk drive 228 for reading from
23 or writing to a removable magnetic disk 229, and/or an optical disk drive 230 for reading
24 from or writing to removable optical disk 231 such as a CD-ROM or other optical media.

Program code means comprising one or more program modules may be stored on the hard disk 239, magnetic disk 229, optical disk 231, ROM 224 or RAM 225, including an operating system 235, one or more application programs 236, other program modules 237, and program data 238. If the server is to directly interface with a user, a user may enter commands and information into the computer 220 through keyboard 240, pointing device 242, or other input devices (not shown), such as a microphone, joy stick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit 221 through a serial port interface 246 coupled to system bus 223. Alternatively, the input devices may be connected by other interfaces, such as a parallel port, a game port or a universal serial bus (USB). A monitor 247 or another display device is also connected to system bus 223 via an interface, such as video adapter 248. In addition to the monitor, the computer 120 may include other peripheral output devices (not shown), such as speakers and printers.

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1 Remote computers 249a and 249b may each be another personal computer, a server, a
2 router, a network PC, a peer device or other common network node, and typically includes
3 many or all of the elements described above relative to the computer 220, although only
4 memory storage devices 250a and 250b and their associated application programs 236a and
5 236b have been illustrated in Figure 2. The logical connections depicted in Figure 2
6 include a local area network (LAN) 251 and a wide area network (WAN) 252 that are
7 presented here by way of example and not limitation. Such networking environments are
8 commonplace in office-wide or enterprise-wide computer networks, intranets and the
9 Internet.

10 When used in a LAN networking environment, the computer 220 is connected to
11 the local network 251 through a network interface or adapter 253. When used in a WAN
12 networking environment, the computer 220 may include a modem 254, a wireless link, or
13 other means for establishing communications over the wide area network 252, such as the
14 Internet. The modem 254, which may be internal or external, is connected to the system
15 bus 223 via the serial port interface 246.

16 In the example of Figure 1, for example, communication may be established over
17 the wireless network 120 using the wireless link. Communication over the network 140
18 may be by any appropriate means such as a network interface card or adapter if the
19 network 140 is a LAN, or a modem, wireless link, or other appropriate means if the
20 network 140 is a WAN.

21 In a networked environment, program modules depicted relative to the computer
22 220, or portions thereof, may be stored in the remote memory storage device. It will be
23 appreciated that the network connections shown are exemplary and other means of
24 establishing communications over wide area network 252 may be used. For example,

1 referring to Figure 1, some of the program modules described as being executed by the
2 expert proxy module may be remotely stored at one or more of the servers 150.

3 In this description and in the claims, a “server” is defined as a computer or group of
4 computers that provides services to another computer system. Also, a “client” is defined
5 as a computer or group of computers that use the services of another computer system.
6 Note that a computer system may use the services of another computer system and yet still
7 provide services to yet another computer system. Thus, a client computer system in one
8 context may also be a server computer system in another context. Similarly, a server
9 computer system in one context may also be a client computer system in another context.

10 Figure 3 illustrates a flowchart of a method of the expert proxy server 130 acting as
11 an agent for the wireless device 110a so as to preserve the limited bandwidth of the
12 wireless network and so as to preserve the limited memory and processing capacity of the
13 wireless device 110a. The steps or acts performed by the wireless device 110a are
14 illustrated in the right hand side of Figure 3 under the heading “DEVICE” while steps or
15 acts performed by the expert proxy server 130 are illustrated in the left hand side of Figure
16 3 under the heading “EXPERT PROXY SERVER”.

17 In the method of Figure 3, the first act performed by the expert proxy server 130 is
18 that the expert proxy server determines that a service is to be provided to a wireless device
19 (act 320). In most cases, the user determines what services are to be provided by
20 subscribing to the content of interest. The expert proxy server then provides the services
21 to the device on the user’s behalf. This determination may be based on a previous request
22 for the service (act 310) made by the wireless device. However, the determination may
23 also be based on a request from a third device such as a wired device or a server to provide
24 the service to the wireless device. This request may have been recently made or may have

1 been given as a default configuration setting when the expert proxy server was first set up
2 and/or when the wireless device first registered with the expert proxy server.

3 After the expert proxy server determines that the service is to be provided to the
4 wireless device, the expert proxy server performs a step for compiling a response using an
5 application that provides the requested service (step 330). If the application is stored
6 locally on the expert proxy server 130, the expert proxy server represents an example of a
7 means for compiling a response using an application that provides the requested service. If
8 the application is stored remotely on one or more of the servers 150, then the expert proxy
9 server 130 in combination with the one or more of the server 150 represents an example of
10 a means for compiling a response using an application that provides the requested service.

11 As part of the step for compiling a response using the application (step 330), the
12 expert proxy server identifies an application that provides the requested service (act 340).
13 Subsequently, the expert proxy server then communicates with the identified application
14 that provides the requested service (act 350). The expert proxy server then compiles the
15 results of the communication with the application (act 360). Upon completion of the step
16 for compiling a response using the application (step 330), the expert proxy server transmits
17 the compilation to the wireless device over the wireless network (act 370).

18 Although the requested service may be any of a number of different services, the
19 method of Figure 3 will now be described with respect to an example service of instant
20 messaging in which the instant messaging services module 113 is used to communicate
21 with the expert proxy server 130. There are a wide number of different instant messaging
22 applications that provide instant messaging services including, for example, MSN ®
23 messenger and AOL INSTANT MESSENGER^(SM). While different instant messenger
24 applications have some differences to differentiate one from another, there are many

In a second alternative, the determination that instant messaging services are to be provided to the wireless device are based on an explicit request from the wireless device made at the beginning of an instant messaging session. The request would then be honored by transmitting presence information updates to the wireless device asynchronously with requiring individual requests until the session terminates. The request would also be honored by rapidly routing instant messages to and from the wireless device. The presence information updates may be transmitted periodically, whenever any presence information changes, or according to some other time criteria. Updated presence information may also be provided synchronously in response to individual requests from the wireless device although this is often undesirable as requiring wireless network bandwidth and additional wireless device processing.

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1 communicates with the instant messaging application appropriate for that network. The
2 appropriate instant messaging application may be stored in the expert proxy server itself or
3 may be stored remotely in one of remote servers 150. The identification of the specific
4 location of the application may be part of the act of identifying the application that
5 provides the requested service.

6 Once the appropriate instant message application is identified, the expert proxy
7 server uses conventional communication methods in communicating with the identified
8 application (act 350). The manner in which the expert proxy server communicates with the
9 application will depend on the application itself. If the application is an MSN ®
10 messenger application, the communication will be according to known methods of
11 communicating with MSN ® messenger applications to provide instant messaging
12 services. If another instant messaging application, the communication may be according to
13 methods of communicating with those instant messaging applications. Generally, these
14 communication methods are published by software developers so as to promote
15 communication and use of their product.

16 Even though the communication mechanism for communicating with these
17 applications are conventional, they may still be quite complex. Since the expert proxy
18 server communicates with the specific instant messaging application rather than the
19 wireless device itself, the wireless device is spared the processing demand (and the
20 wireless devices is spared the bandwidth demand) of having to deal directly with the
21 identified application.

22 The communication with the identified instant messaging application results in one
23 or more responses from the instant messaging application. The responses might include,
24 for example, presence information or acknowledgement message(s) that indicate the

1 delivery status of the instant message. The expert proxy server compiles one or more of
2 the responses from the identified application by either including the response as received
3 from the application or by conducting appropriate translation of the response so that the
4 response may be interpreted by the generic application used by the wireless device. The
5 compilation may include one or more responses from the identified application where each
6 response is included with or without being translated.

7 The compilation of instant messaging information is then transmitted to the
8 wireless device as a compilation. Thus, in cases in which multiple responses are included
9 in the compilation, the bandwidth of the wireless network is typically preserved as
10 compared to transmitting each response independently. Thus, the expert proxy server
11 again preserves the bandwidth of the wireless network.

12 Instant messaging is but one service that the expert proxy service can provide as an
13 agent for the wireless device. Another is a storage service which may be generically
14 implemented at the wireless device using the storage service module 114. To support
15 storage services, the expert proxy server stores information for the wireless device and
16 provides the wireless device with an identifier that identifies information. When the
17 wireless device needs the information, the wireless devices provide the identifier to the
18 expert proxy server. The expert proxy server then provides the identified information to
19 the wireless device. In some cases, this might involve the expert proxy server retrieving
20 information from remote servers 150.

21 In the case of storage services, the expert proxy server would determine that the
22 storage service is to be provided, and then communicate with applications that store
23 information. For example, the application might be the file system of the expert proxy
24 server operating system or an in-box corresponding to the wireless device. Upon receiving

an identifier of information from the wireless device, the expert proxy server would then communicate with the application (e.g., the file system) to retrieve the information. The information would then be compiled into a response and transmitted back to the wireless device. Thus, information that would otherwise have been stored at the wireless device is now stored at the expert proxy server thereby preserving the limited memory capacity of the wireless device.

Another example of an expert proxy server supported service is a customized page service which the wireless device may implement by executing the customized page service module 115. In this case, the wireless device may submit a request that asks to “show me my customized page.” That is a simple request that may be represented by very little data transmitted over the wireless network. Furthermore, it takes very little processing to make such a request. Upon receiving the request, the expert proxy server handles the more complex details of communication. For example, to form the customized page information, the expert proxy server may log into a server (e.g., server 150) on behalf of the wireless device, requesting and retrieving today’s calendar appointments, the most recently used contacts, and other customized information. The expert proxy server then translates the responses as needed to be in a form recognized by the wireless device. The compilation of this information is then transmitted back to the wireless device.

In the case of the customized page, the generic application at the wireless device only needed to make the request, parse the compilation, and render the information on the screen. The more complex acts of deciding what information to retrieve and where to retrieve the information from are performed by the expert proxy server. Thus, the generic version of the customization page program is relatively small which preserves wireless

device memory. Furthermore, the processing at the wireless device is straightforward thus preserving the wireless device processing.

The expert proxy server could also support reservations services which may be generically implemented by the wireless device by executing the reservations services module 116. In this case, the wireless device might transmit a request such as “show me available flights from city A to city B with an approximate departure time of 3:00 pm on Monday” or perhaps “show me all my existing reservations.” Again, these requests could be made over the wireless network using very little bandwidth. The expert proxy server would then determine what application might be able to fulfill the request. For example, the expert proxy server could communicate with a number of applications hosted by the airlines to determine available flights that satisfy the constraints in the request, or to determine any of the user’s reservations on at that airline. This may involve extensive communication with these applications which is handled by the expert proxy server instead of by the wireless device. The results of the communications are then gathered and sent to the wireless device. The wireless device needed to only submit the request and interpret the results. The more detailed communications were handled by the agent expert proxy server.

The expert proxy server could also support bidding services which may be generically implemented by the wireless device by executing the bidding services module 117. In this case, the wireless device might transmit a request such as “let me know when any auction applications are going to auction a U.S. penny minted in 1909 bearing the marked SVDP.” This was a very simple request that could be made by a simple program stored on the wireless device. The expert proxy server could then handle all the details on behalf of the wireless device. For example, the expert proxy server could communicate

1 with a number of auction Web pages and monitor for the requested item. Once the expert
2 proxy server receives word from one of these applications that the requested item is being
3 auctioned, the expert proxy server would then notify the wireless device.

4 These applications are just examples of how the principles of the present invention
5 may be used to have an expert proxy server act as an agent on behalf of a wireless device
6 to reduce the memory, processing and bandwidth requirements of the wireless device. The
7 present invention may be embodied in other specific forms without departing from its spirit
8 or essential characteristics. The described embodiments are to be considered in all respects
9 only as illustrative and not restrictive. The scope of the invention is, therefore, indicated
10 by the appended claims rather than by the foregoing description. All changes which come
11 within the meaning and range of equivalency of the claims are to be embraced within their
12 scope.

13 What is claimed and desired to be secured by United States Letters Patent is:
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2 3. A method in accordance with Claim 1, wherein the specific act of the expert
3 proxy server computer system communicating with the identified application that provides
4 the service comprises the following:

5 a specific act of the expert proxy server communicating with one of the
6 plurality of server computer systems over the external network that hosts the
7 identified application.

8
9 4. A method in accordance with Claim 1, wherein the specific act of the expert
10 proxy server computer system communicating with the identified application that provides
11 the service comprises the following:

12 a specific act of the expert proxy server submitting a plurality of separate
13 communications to the application; and

14 a specific act of the expert proxy server receiving a response to at least
15 some of the plurality of communications.

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17 5. A method in accordance with Claim 1, wherein the service includes an
18 instant messaging service.

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20 6. A method in accordance with Claim 1, wherein the service includes a
21 storage service.

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23 7. A method in accordance with Claim 1, wherein the service includes a
24 customized page service.

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8. A method in accordance with Claim 1, wherein the service includes a reservations service.

9. A method in accordance with Claim 1, wherein the service includes a bidding service.

1 10. A computer program product for use in an expert proxy server computer
2 system that is coupled to a plurality of wireless devices through a wireless network,
3 wherein the expert proxy server is coupled through a network to a plurality of server
4 computer systems, the expert proxy server either directly or in conjunction with the
5 plurality of server computer systems offering a plurality of applications that provide a
6 service, the computer program product for implementing a method of the expert proxy
7 server acting as an agent for a wireless device so as to preserve the limited memory and
8 processing capacity of the wireless device, the computer program product having a
9 computer-readable medium having stored thereon computer-executable instructions for
10 performing the following:

11 a specific act of determining that a service is to be provided to a wireless
12 device;

13 a specific act of identifying an application that provides the service;

14 a specific act of causing the expert proxy server computer system to
15 communicate with the application that provides the service;

16 a specific act of compiling the results of the communication with the
17 application; and

18 a specific act of causing the expert proxy server computer system to
19 transmit the compilation to the wireless device over the wireless network.

20
21 11. A computer program product in accordance with Claim 10, wherein the
22 computer-executable instructions for performing the specific act of determining that a
23 service is to be provided to a wireless device comprises computer-executable instructions
24 for performing the following:

1 a specific act of receiving a request from the wireless device to provide the
2 service.

3

4 12. A computer program product in accordance with Claim 10, wherein the
5 computer-executable instructions for performing the specific act of causing the expert
6 proxy server computer system to communicate with the application that provides the
7 requested service comprises computer-executable instructions for performing the
8 following:

9 a specific act of the expert proxy server communicating with one of the
10 plurality of server computer systems over the external network that hosts the
11 identified application.

12

13 13. A computer program product in accordance with Claim 10, wherein the
14 computer-executable instructions for performing the specific act of causing the expert
15 proxy server computer system to communicate with the application that provides the
16 requested service comprises computer-executable instructions for performing the
17 following:

18 a specific act of causing the expert proxy server to submit a plurality of
19 separate communications to the application; and

20 a specific act of receiving a response to at least some of the plurality of
21 communications.

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1 14. In a network that includes an expert proxy server computer system that is
2 coupled to a plurality of wireless devices through a wireless network, wherein the expert
3 proxy server provides is coupled through a network to a plurality of server computer
4 systems, the expert proxy server either directly or in conjunction with the plurality of
5 server computer systems offering a plurality of applications that provide a service, a
6 method of the expert proxy server acting as an agent for a wireless device so as to preserve
7 the limited memory and processing capacity of the wireless device, the method comprising
8 the following:

9 a specific act of the expert proxy server computer system determining that a
10 service is to be provided to a wireless device;

11 a step for compiling a response using an application that provides the
12 service; and

13 a specific act of the expert proxy server computer system transmitting the
14 compilation to the wireless device over the wireless network.

15
16 15. A method in accordance with Claim 14, wherein the step for compiling a
17 response using an application that provides the service comprises the following:

18 a specific act of the expert proxy server computer system identifying an
19 application that provides the service;

20 a specific act of the expert proxy server computer system communicating
21 with the identified application that provides the service; and

22 a specific act of the expert proxy server computer system compiling the
23 results of the communication with the application.
24

1 16. A method in accordance with Claim 15, wherein the specific act of the
2 expert proxy server determining that a service is to be provided to a wireless device
3 comprises the following:

4 a specific act of the expert proxy server receiving a request from the
5 wireless device to provide the service.
6

7 17. A method in accordance with Claim 15, wherein the specific act of the
8 expert proxy server computer system communicating with the identified application that
9 provides the service comprises the following:

10 a specific act of the expert proxy server communicating with one of the
11 plurality of server computer systems over the external network that hosts the
12 identified application.
13

14 18. A method in accordance with Claim 15, wherein the specific act of the
15 expert proxy server computer system communicating with the identified application that
16 provides the service comprises the following:

17 a specific act of the expert proxy server submitting a plurality of separate
18 communications to the application; and

19 a specific act of the expert proxy server receiving a response to at least
20 some of the plurality of communications.
21

22 19. A method in accordance with Claim 15, wherein the service includes an
23 instant messaging service.
24

1 20. A method in accordance with Claim 15, wherein the service includes a
2 storage service.

3
4 21. A method in accordance with Claim 15, wherein the service includes a
5 customized page service.

6
7 22. A method in accordance with Claim 15, wherein the service includes a
8 reservations service.

9
10 23. A method in accordance with Claim 15, wherein the service includes a
11 bidding service.

1 24. A computer program product for use in an expert proxy server computer
2 system that is coupled to a plurality of wireless devices through a wireless network, ,
3 wherein the expert proxy server provides is coupled through a network to a plurality of
4 server computer systems, the expert proxy server either directly or in conjunction with the
5 plurality of server computer systems offering a plurality of applications that provide a
6 service, the computer program product for implementing a method of the expert proxy
7 server acting as an agent for a wireless device so as to preserve the limited bandwidth of
8 the wireless network and so as to preserve the limited memory and processing capacity of
9 the wireless device, computer program product having a computer-readable medium
10 having stored thereon computer-executable instructions for performing the following:

11 a specific act of determining that a service is to be provided to a wireless
12 device;

13 a step for compiling a response using an application that provides the
14 service; and

15 a specific act of causing the expert proxy server computer system to
16 transmit the compilation to the wireless device over the wireless network.

ABSTRACT OF THE DISCLOSURE

An expert proxy server is described that is coupled to a number of wireless devices through a wireless network, and to a number of server computer systems through an external network such as, for example, the Internet. The expert proxy server acts as an agent for a wireless device by providing a service for the wireless device. Specifically, the expert proxy server determines that a service is to be provided to the wireless device. Next, the expert proxy server identifies an application that provides the service and then communicates with the identified application that provides the service. The expert proxy server compiles the results of the communication with the application and then transmits the compilation to the wireless device over the wireless network. Thus, the relatively smaller bandwidth of the wireless network is preserved by transmitting a minimal amount of information over the wireless network while leaving more extensive communications to occur over higher bandwidth external networks. Also, since the extensive processing occurs at the expert proxy server rather than at the wireless device, the application on the wireless device may be simplified and smaller as compared to the supporting applications on the expert proxy server thereby preserving the limited memory and processing capability of the wireless device.

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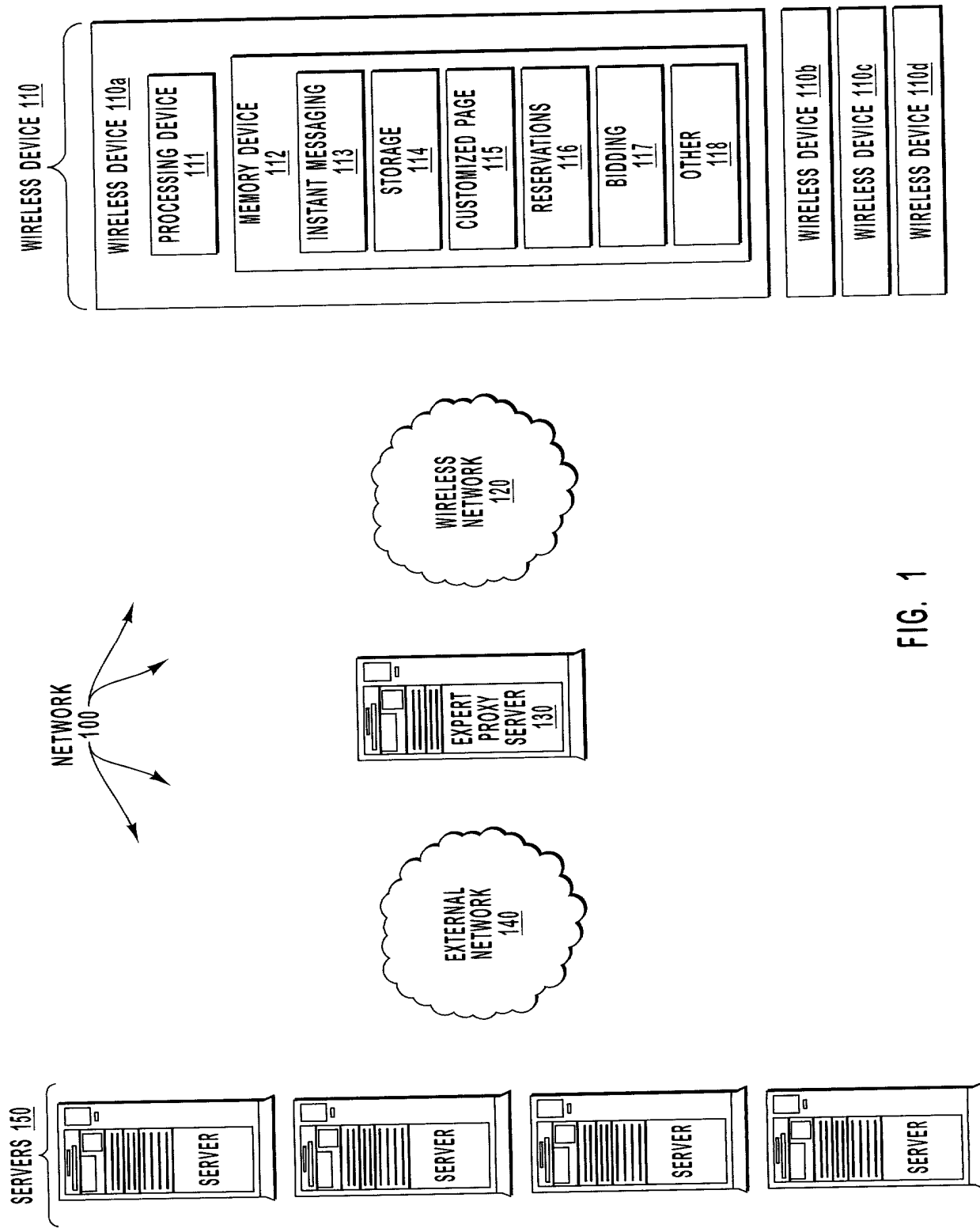
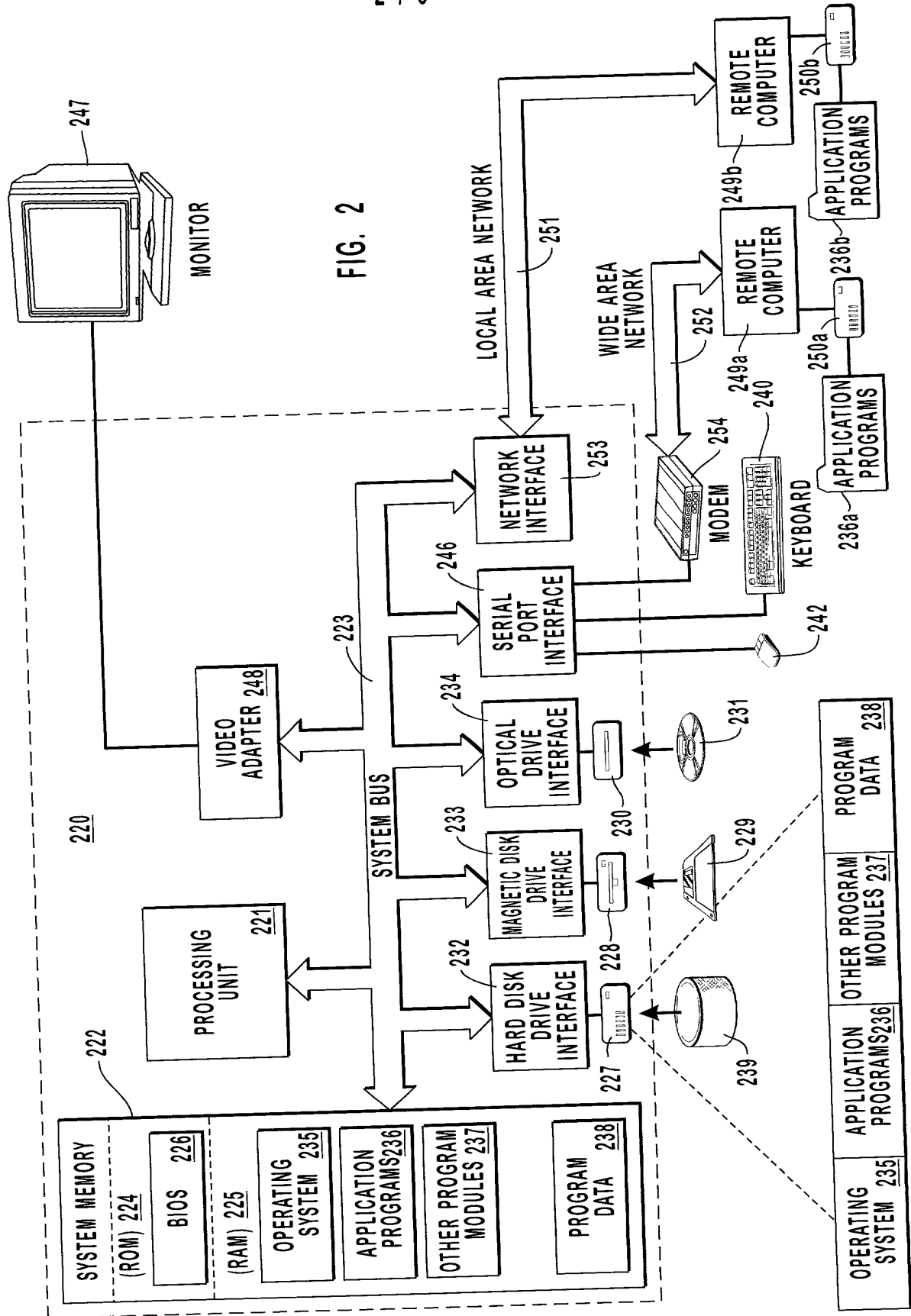


FIG. 1



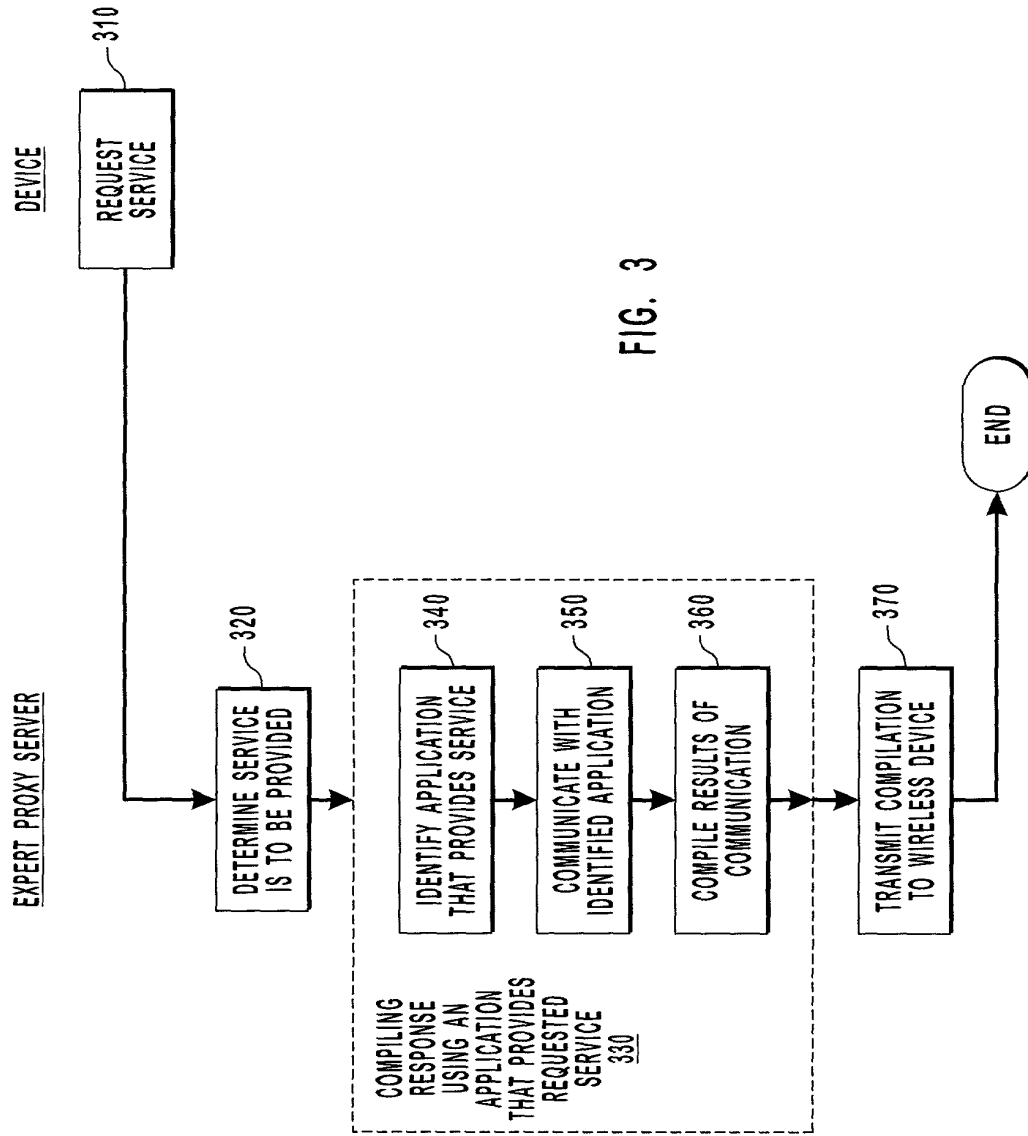


FIG. 3

DECLARATION, POWER OF ATTORNEY, AND PETITION

We,

- (1) Name: Donald J. Kadyk
Address: 20022 34th Avenue SE
Bothell, WA 98012
Citizenship: United States of America
- (2) Name: Neil S. Fishman
Address: 23710 22nd Drive SE
Bothell, WA 98012
Citizenship: United States of America
- (3) Name: Marc Seinfeld
Address: 16001 Inglewood Road NE
Kenmore, WA 98029
Citizenship: United States of America

declare: that our citizenship, residence address, and post office address are as set forth above; that we verily believe we are the original, first and joint inventors of the subject matter of the invention or discovery entitled "USING AN EXPERT PROXY SERVER AS AN AGENT FOR WIRELESS DEVICES," for which a patent is sought and which is described and claimed in the specification attached hereto; and that we acknowledge the duty to disclose information which is material to the examination of this application in accordance with Section 1.56(a) of Title 37 of the Code of Federal Regulations.

We declare further that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that

such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

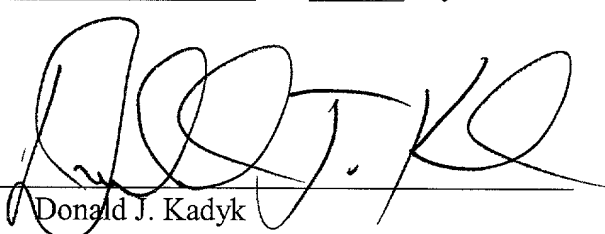
We hereby appoint as our attorneys and/or patent agents all listed under Customer No. 022913; and DANIEL D. CROUSE, Registration No. 32,022; and KATIE SAKO, Registration No. 32,628, of MICROSOFT CORPORATION, One Microsoft Way, Redmond, Washington 98052, with full power to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith. All correspondence and telephonic communications should be directed to:

Rick D. Nydegger
WORKMAN, NYDEGGER & SEELEY
1000 Eagle Gate Tower
60 East South Temple
Salt Lake City, Utah 84111

Wherefore, we pray that Letters Patent be granted to us for the invention or discovery described and claimed in the foregoing specification and claims, declaration, power of attorney, and this petition.

Signed at REDMOND WA, _____ this 30 day of
SEPT., 2000.

Inventor: _____


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20022 34th Avenue SE
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Signed at Redmond, Wa. this 28 day of
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September, 2000.

Inventor: Marc Seinfeld
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Study	Year	Country	Sample Size (n)	Age Range (years)	Prevalence (%)	95% CI (%)	Notes
1	1998	USA	1,000	18-24	1.2	0.5-2.1	General population
2	2001	USA	2,500	25-34	1.8	0.9-3.2	General population
3	2003	USA	1,500	35-44	2.5	1.2-4.5	General population
4	2005	USA	3,000	45-54	3.2	1.8-5.5	General population
5	2007	USA	2,000	55-64	4.1	2.3-7.2	General population
6	2009	USA	1,800	65-74	5.3	3.1-8.8	General population
7	2011	USA	2,200	75-84	6.7	4.0-11.0	General population
8	2013	USA	2,800	85-94	8.2	5.0-13.5	General population
9	2015	USA	3,500	95-104	9.8	6.0-16.0	General population
10	2017	USA	4,000	105-114	11.5	7.0-18.5	General population
11	2019	USA	4,500	115-124	13.2	8.0-21.5	General population
12	2021	USA	5,000	125-134	15.1	9.0-24.0	General population
13	2023	USA	5,500	135-144	17.0	10.0-28.0	General population
14	2025	USA	6,000	145-154	19.0	11.0-32.0	General population
15	2027	USA	6,500	155-164	21.0	12.0-38.0	General population
16	2029	USA	7,000	165-174	23.0	13.0-42.0	General population
17	2031	USA	7,500	175-184	25.0	14.0-46.0	General population
18	2033	USA	8,000	185-194	27.0	15.0-50.0	General population
19	2035	USA	8,500	195-204	29.0	16.0-54.0	General population
20	2037	USA	9,000	205-214	31.0	17.0-58.0	General population
21	2039	USA	9,500	215-224	33.0	18.0-62.0	General population
22	2041	USA	10,000	225-234	35.0	19.0-66.0	General population
23	2043	USA	10,500	235-244	37.0	20.0-70.0	General population
24	2045	USA	11,000	245-254	39.0	21.0-74.0	General population
25	2047	USA	11,500	255-264	41.0	22.0-78.0	General population
26	2049	USA	12,000	265-274	43.0	23.0-82.0	General population
27	2051	USA	12,500	275-284	45.0	24.0-86.0	General population
28	2053	USA	13,000	285-294	47.0	25.0-90.0	General population
29	2055	USA	13,500	295-304	49.0	26.0-94.0	General population
30	2057	USA	14,000	305-314	51.0	27.0-98.0	General population
31	2059	USA	14,500	315-324	53.0	28.0-100.0	General population
32	2061	USA	15,000	325-334	55.0	29.0-100.0	General population
33	2063	USA	15,500	335-344	57.0	30.0-100.0	General population
34	2065	USA	16,000	345-354	59.0	31.0-100.0	General population
35	2067	USA	16,500	355-364	61.0	32.0-100.0	General population
36	2069	USA	17,000	365-374	63.0	33.0-100.0	General population
37	2071	USA	17,500	375-384	65.0	34.0-100.0	General population
38	2073	USA	18,000	385-394	67.0	35.0-100.0	General population
39	2075	USA	18,500	395-404	69.0	36.0-100.0	General population
40	2077	USA	19,000	405-414	71.0	37.0-100.0	General population
41	2079	USA	19,500	415-424	73.0	38.0-100.0	General population
42	2081	USA	20,000	425-434	75.0	39.0-100.0	General population
43	2083	USA	20,500	435-444	77.0	40.0-100.0	General population
44	2085	USA	21,000	445-454	79.0	41.0-100.0	General population
45	2087	USA	21,500	455-464	81.0	42.0-100.0	General population
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